Bachechi Environmental Education Building

Albuquerque, New Mexico 2011

Bachechi Environmental Education Building

CONCEPT STATEMENT

As part of a 29 acre masterplan developed by Landscape Architects Sites Southwest on the original site of the Bachechi Family Farm in Albuquerque's North Valley, the 2,200 sf Bachechi Environmental Education Building is intended to reinforce the sustainable ethic represented in the landscape. The building functions as an extension of the site experience. As part of an energy efficiency pilot project for Bernalillo County, the Education Building is also intended to be "on-display" where possible, with systems and material components noted and explained. Programmatic extensions of the Education Building include a shaded Outdoor Classroom, the Bachechi Family Memorial Rose Garden / Interpretive display, a County storage building and a Caretakers residence.

THE SITE

The building is sited along the lane lateral and the existing pecan grove – shaped to create a south facing courtyard and to minimize development in the larger open part of the site. The Education Building is located along a trail rather than at the end of a trail and specifically frames views of the wetland and fallow field wildlife areas – while also orienting to cardinal points, existing site features like the pump station and distant geologic landmarks of the West Mesa Volcanoes and Sandia Mountains to the east. An 'aquarium' view window in the classroom aims at the adjacent acequia, wetland pond and city pump station – visually connecting kids to the larger hydrological systems present on site.

TYPOLOGY / TECHNOLOGY

Building systems - both passive and active – are arrayed around the south facing archetypal SW courtyard implied by the building's geometry. A 4kW bi-facial PV trellis shades a south facing 'portal' defining an outdoor learning area. A water collection system collects all roof water for use in the courtyard gardens. Strategically located operable windows capture prevailing summers breeze to help cool the interior spaces. High glazing in the gallery hall admits bounced natural light into the gallery space. Vine covered fences mitigate temperature around the building patios. A digital readout in the fully glazed mechanical room will compare energy use generated by the 4kW PV system to the actual energy demand of the building as well as display the evaporative cooling system.

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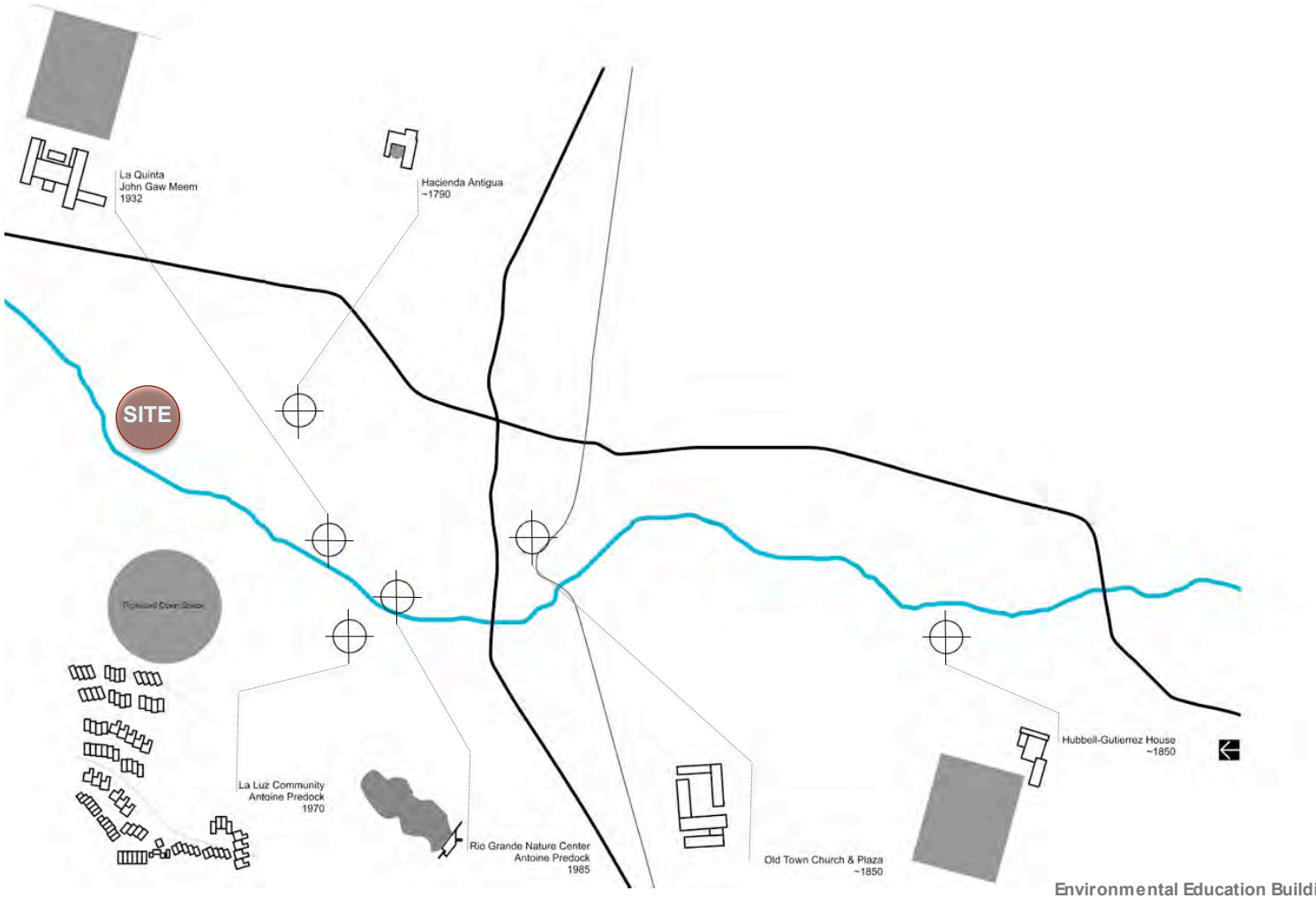
PROJECT DATA

GSF
2200 sf

Structure
exposed concrete / slab on grade
2x6 wood frame
pre-manufactured wood trusses
tube steel steel columns

Materials & Systems
4kW bi-facial panel PV's
exposed concrete floors
rusty metal roofs
black iron steel trellis & PV array support
thermally-broken storefront glazing
smooth finish drywall
homasote pin-up wall panels
rough sawn pine wood ceiling
zero-voc paints
fluorescent & LED lighting
high-efficiency mechanical equipment
cementitious stucco
maximized daylighting
natural ventilation

Site Features
Rio Grande bosque
xeriscaping
permeable surfaces
view to Sandia Mnts & volcanoes
wind break from existing trees
existing Lane Lateral / acequia
wetlands / viewing blinds
arboretum
fallow fields / migrating bird flyway
outdoor classroom
memorial gardens



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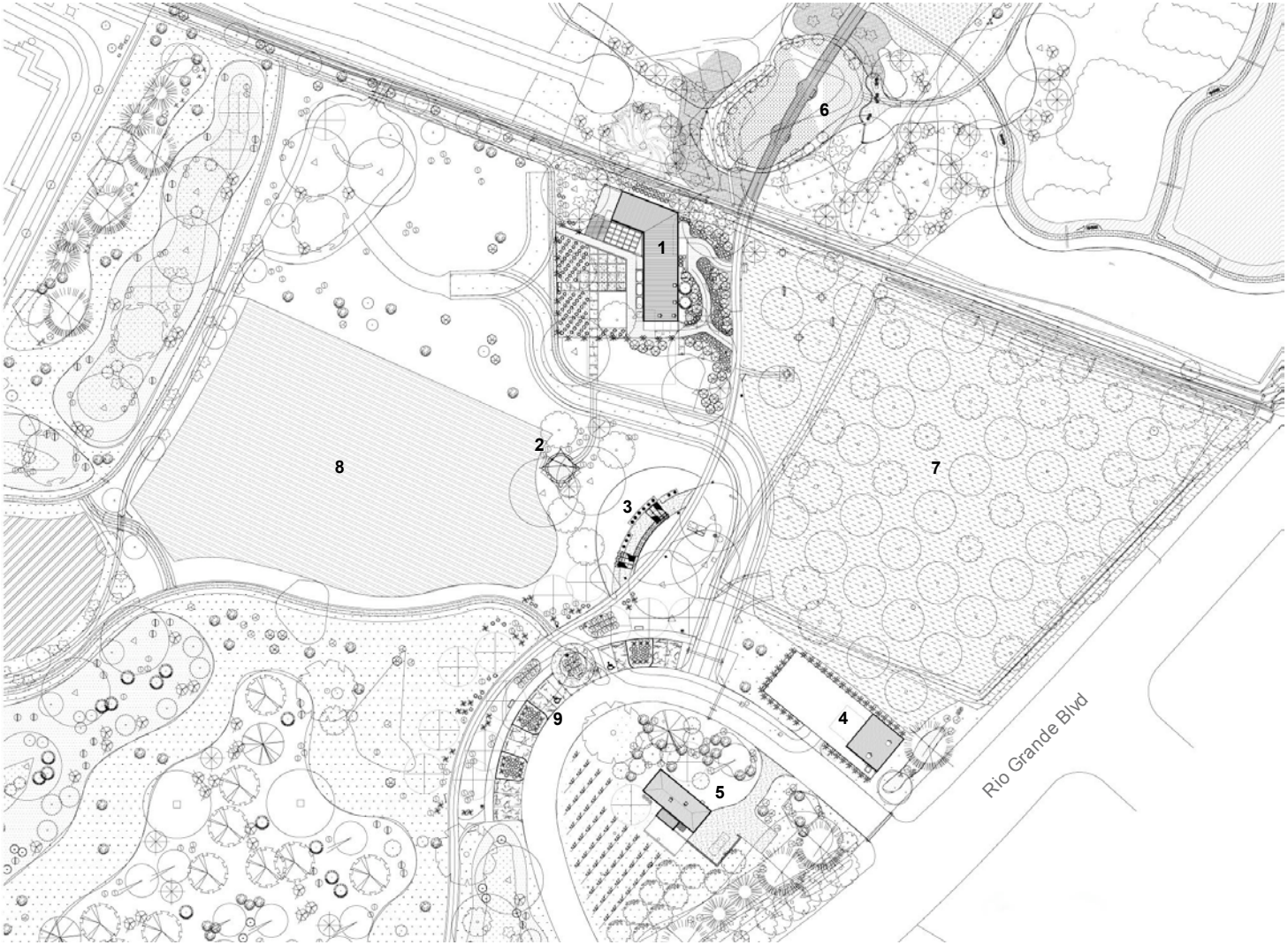
SITE CONTEXT

Cultural properties building / land relationships along the Rio Grande

Environmental Education Building

SITE AERIAL



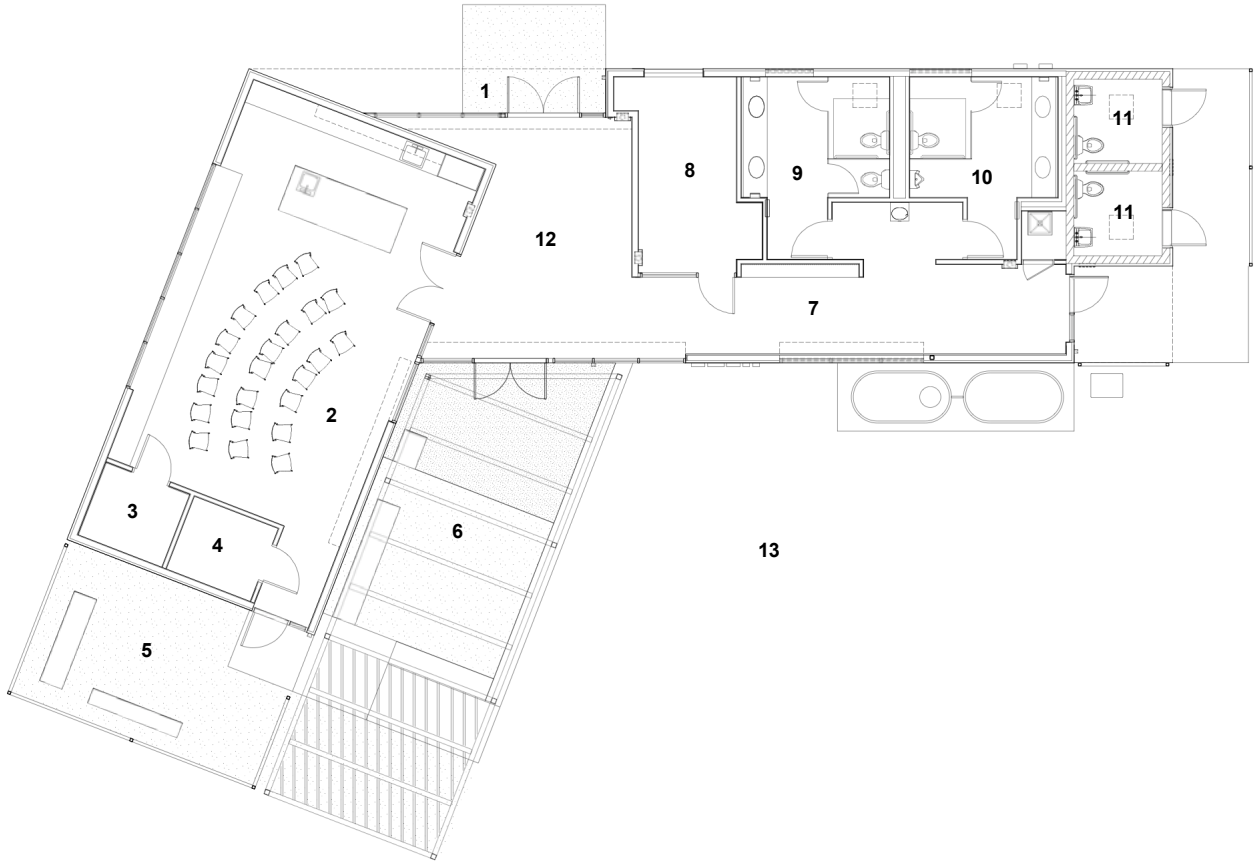
1 Environmental Education Building
2 Outdoor Classroom
3 Bachechi Family Memorial Rose Garden
4 County Equipment Maintenance Building and Yard
5 Open Space Caretaker's Residence

6 New Wetland
7 Existing Pecan Orchard
8 Fallow Fields / Bird Flyway
9 Parking

Environmental Education Building

SITE PLAN

0' 30' N



1 Covered Entry
2 Classroom / Lab
3 Telecom Room
4 Storage
5 Classroom Courtyard
6 Solar Patio
7 Gallery
8 Mechanical Room
9 Women's Restroom
10 Men's Restroom
11 Exterior Access Restrooms
12 Entry / Lobby
13 Courtyard

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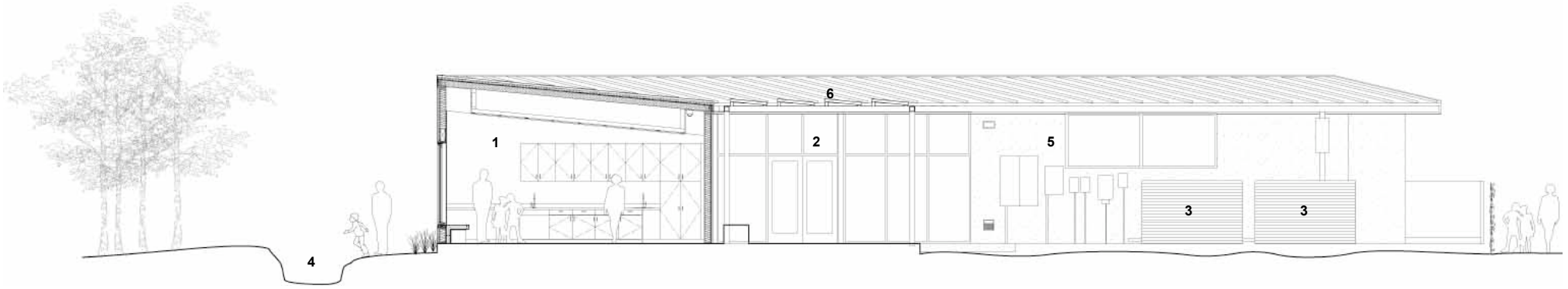
FLOOR PLAN

0' 10' N

1 Classroom / Lab
2 Solar Patio
3 Rainwater cisterns
4 Lane Lateral / acequia
5 Building systems / PV meters on display
6 4kW Bifacial PV System



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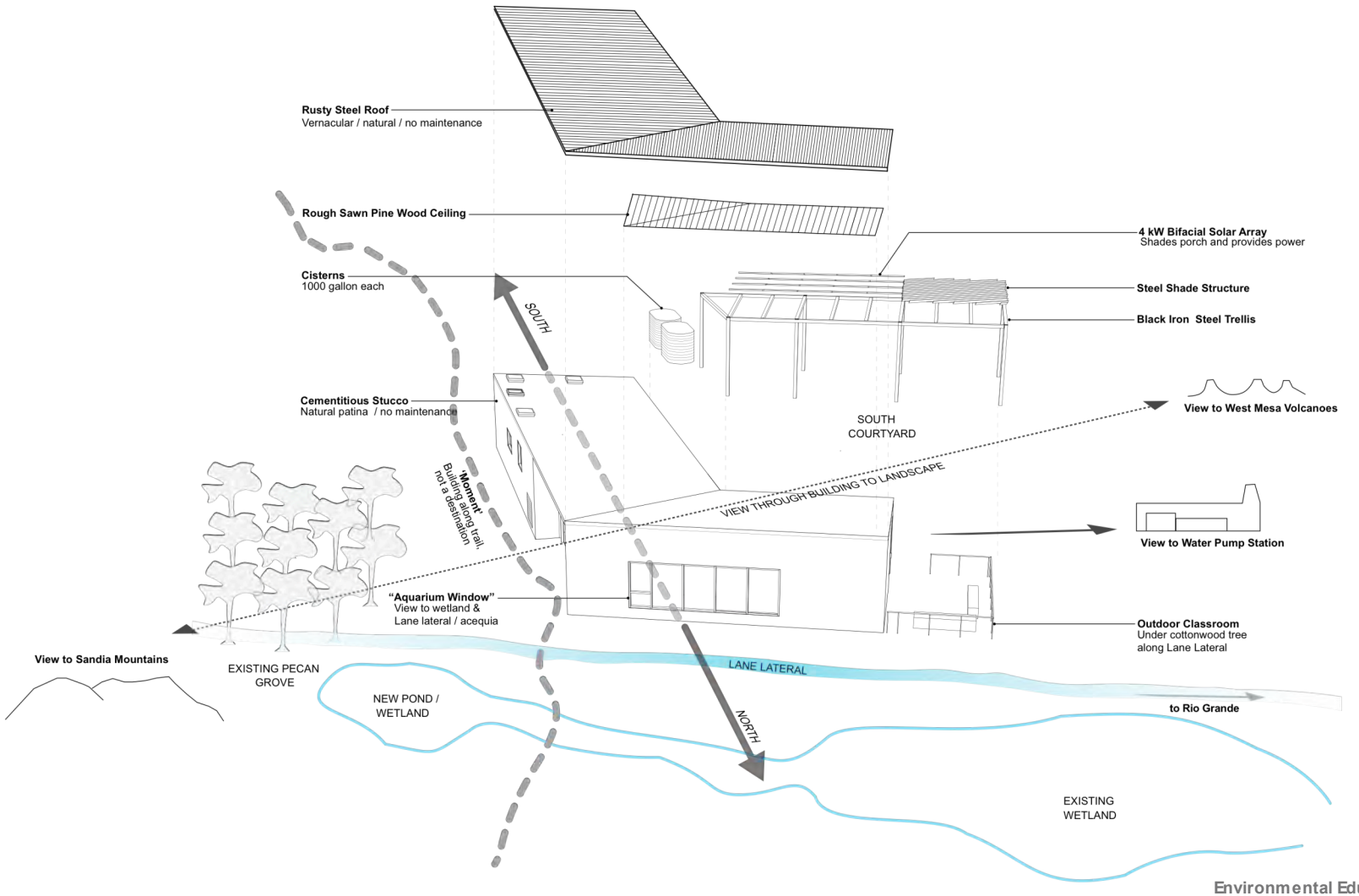
SECTION / THROUGH LANE LATERAL AND CLASSROOM

0' 10'



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AXONMETRIC DIAGRAM

1 STRATEGICALLY LOCATED OPERABLE WINDOWS
- Minimize heat gain, balance daylighting and induce cross ventilation

2 PHOTOVOLTAIC PANELS
Grid-tied 4kW bi-facial photovoltaic array shades windows and patio with net metering to sell back excess power

3 CENTRL COOLING SYSTEM
- HIgh-efficiency 2-stage evaporative cooling system

4 RAINWATER HARVESTING
- (2) 1000 gal. water cisterns for garden courtyard irrigation

5 INSULATION
- Wood structure to reduce thermal bridging
- R-49 Roof insulation (including R-20 Icynene)
- R-24 Wall insulation (including 1" rigid @all ext. walls)

PV METER / INVERTER ON DISPLAY

MECH. ROOM GLAZING

- Building systems "on-display"

NATURAL LIGHT IN ALL SPACES
LOW EMBODIED ENERGY,
LOW MAINTENANCE MATERIALS
- Sealed concrete floor
- Low - VOC paint
- Rough sawn pine ceiling
- Cementitious stucco
- Unprimed black iron steel trellis and roof panels
- Homasote wall panels (recycled newsprint)
- All concrete contains 15% fly-ash

LOW-FLOW PLUMBING FIXTURES

HIGH - EFFICIENCY LED AND FLOURESCENT LIGHTING

INSULATED, THERMALLY BROKEN LOW-E GLAZING

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BUILDING DIAGRAM

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EAST ENTRY FROM PECAN ORCHARD

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SOLAR PATIO AND SOUTH ENTRY

SOUTH ELEVATION


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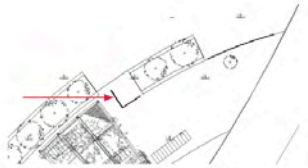
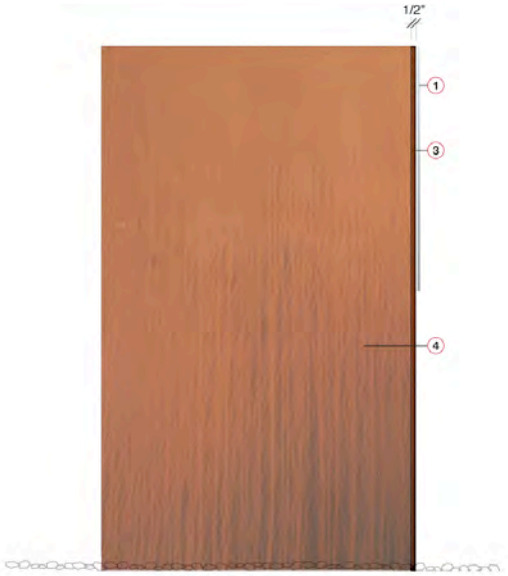
BACHECHI FAMILY MEMORIAL ROSE GARDEN

1. 'AlumiColor' aluminum plate w/historic family photo of the Bachechi Family Farm
2. 1/2" thick steel plate, painted w/high gloss paint
3. EDGE of steel plate revealed.
4. BACK side of steel plate left to rust.





DETAIL / SIGN TWO B / REAR + SIDE ELEVATION

DETAIL / SIGN TWO B / FRONT ELEVATION

SCALE: 1" = 1'0"

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BACHECHI FAMILY MEMORIAL ROSE GARDEN

INTERPRETIVE DISPLAY / EXHIBIT DESIGN


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WEST ENTRY
WEST ELEVATION

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EAST ENTRY

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SOLAR PATIO AND WEST ENTRY

SOUTH WEST ELEVATION

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SOLAR PATIO

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SOLAR PANELS

4kW BI-FACIAL PV PANELS AT SOLAR TRELLIS


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LANE LATERAL / ACEQUIA
COURTYARD CLASSROOM

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OUTDOOR CLASSROOM

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SOLAR PATIO / LOBBY

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CLASSROOM / LAB

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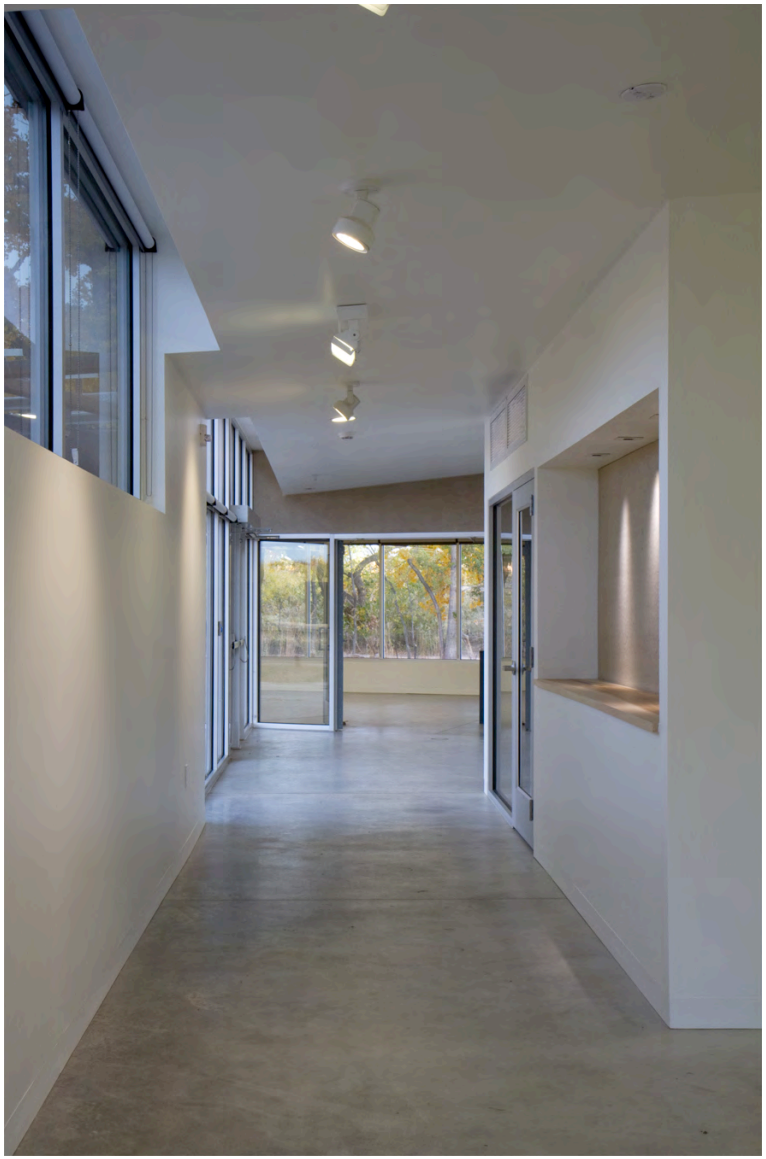
CLASSROOM / LAB



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CORRIDOR / GALLERY